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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/691,700	10/24/2003	Charles W. Propst JR.	APV31437A	6803

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EXAMINER	
CORDRAY, DENNIS R	

ART UNIT	PAPER NUMBER
1731	

DATE MAILED: 08/01/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/691,700	PROPST ET AL.	
	Examiner	Art Unit	
	Dennis Cordray	1731	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *24 May 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,6-10,13-15,18-20,23-27,30-32,36-39 and 41-47* is/are pending in the application.

4a) Of the above claim(s) *1,6-10,13-15,18-20,23-25,32 and 36-39* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *26-27,30-31;41-47* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *7/6/2006*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

Claim 42 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Claim 42 recites examples of butyl, amyl, octyl, hexadecyl, vinyl acetate, vinyl chloride, vinylidene chloride, isobutylene and vinyl ethers as acrylic acid containing material. The above species are not acrylic acid containing materials and thus expand rather than limit the subject matter of the previous claim.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 26-27, 30-31 and 41-47 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 26 recites an amount of acrylic acid no greater than 10 dry lbs/ton but fails to indicate whether the "per ton" refers to tons of furnish, tons of dry fiber, tons of paper or tons of the composition. The scope of the claim is thus indefinite.

Claim 42 recites examples of butyl, amyl, octyl, hexadecyl, vinyl acetate, vinyl chloride, vinylidene chloride, isobutylene and vinyl ethers as acrylic acid containing material. The meaning of the species methylacrylate vinyl acetate is also not

understood. It is not clear how the above species can be acrylic acid containing materials, thus scope of the claim is indefinite.

The remaining claims are dependent on claim 26 and thus inherit the indefiniteness thereof.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 26-27, 30 and 43 are rejected under 35 U.S.C. 102(b) as being anticipated by Downey (2627477).

Downey discloses an aqueous emulsion comprising a higher alkyl ketene dimer (col 1, lines 1-2) that can be used for sizing paper (col 1, lines 28-31). The alkyl group can have from 6-20 carbon atoms, with decyl and hexadecyl being recited as examples (col 1, lines 50-51; col 2, lines 27-28; col 3, lines 15-20; Claims 1-4). The emulsion can contain starch (col 1, lines 20-25; col 3, lines 41-46). The paper sized with the alkyl ketene dimer and starch thus becomes a composition comprising wood fibers.

Note that the language for Claim 26 allows for a composition comprising only alkyl ketene dimer since an amount of acrylic acid no greater than 10 dry lbs/ton reads on zero acrylic acid and if there is no acrylic acid, there is no need for a crosslinking agent.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 26, 27, 30, 31, 41, 42, 44, 45, 47 are rejected under 35 U.S.C. 103(a) as unpatentable over Kijlstra et al (CA 2354966) or Westman et al (WO 02/25013) in view of Nigam (6171444) and further in view of Carlson (2726230).

Kijlstra et al disclose a cationic composition (p 2, lines 18-19) comprising:

- A cationic polymer dispersion containing particles comprising an acrylic acid ester and a cationic emulsifier containing an acrylic acid ester (acrylic acid containing composition) and a cationic monomer (p 2, lines 18-28; p 3, lines 1-11);
- Wood fibers when the polymers are used as a sizing composition (p 12, lines 20-31);
- Alkyl ketene dimer (AKD) and/or alkyl succinic anhydride (ASA) when the base papers are pre-sized (p 13, lines 20-27); and
- A cationic starch (p 13, lines 27-31).

As defined in the instant disclosure, p 8, "acrylic acid containing" refers to "materials and compositions, such as polymers, oligomers, or monomers, comprising at least one acrylic or acrylic acid moiety." An acrylic acid ester thus fits within the definition. Kijlstra indicates that the AKD and/or ASA may be used to presize the base

paper when the cationic polymer dispersion is used as a surface size. When the cationic polymer dispersion is added to the surface, the sized paper contains the wood fibers, AKD or ASA, and acrylic acid composition of the claimed invention.

The cationic dispersions are added as surface sizing agents are present in an amount of 0.1 to 10% of the size liquor (p 13, lines 24-26). In the examples given the uptake of the sizing liquor on paper, liner and board is from 29-68% (p 27, line 19 to p 28, line 7), thus the amount of acrylic containing composition is from 0.58 to 136 lb/ton of paper.

Westman et al discloses a composition added to a papermaking furnish (contains wood fibers) or to the formed paper web prior to entering an impulse drying unit (p 1, lines 2-7). The composition comprises a polymer and anionic microparticles (p 3, lines 2-15 and 27-28). The polymers can be cationic starches (p 3, lines 33-34). The anionic microparticles can be organic microparticles comprising (meth)acrylic acid copolymers (p 6, lines 29-34) and can be crosslinked.. The anionic organic particles are present in an amount of 0.01 to 10 kg/metric ton, or 0.2 to 20 lb/ton of dry pulp and fillers (p 7, lines 4-9). Conventional sizing agents can also be used, such as alkyl ketene dimers or alkenyl succinic anhydride (p 7, lines 32-33). Westman et al discloses that the pH of the sizing solution should be controlled within the range of 4-9 (p 8, lines 1-2).

Kijlstra et al and Westman et al do not disclose the addition of a crosslinking agent to the composition although Westman et al discloses that the anionic microparticles can be crosslinked..

Nigam discloses a sizing composition comprising a polyacid (abstract), which can be a polyacrylic acid (col 8, lines 54-57), a cationic starch (col 9, lines 12-13 and 36-41), and a crosslinking agent for intramolecular and/or intermolecular crosslinking of sizing agents (col 10, lines 52-56), thus teaching that it is known in the art to crosslink sizing compositions.

Carlson discloses polyvalent metallic oxides that are crosslinking agents for acrylic containing polymers (col 1, lines 63-72 and col 2, lines 1-22). Specific examples given are oxides of zinc, calcium, magnesium, tin, titanium, and aluminum (col 6, lines 67-75).

The art of Kijlstra et al, Westman et al, Nigam, Carlson and the instant invention are analogous as pertaining to compositions containing polymers comprising acrylic acid or acrylic acid derivatives. It would have been obvious to one of ordinary skill in the art at the time of the invention to add a polyvalent metal oxide crosslinking agent to the composition of Kijlstra et al or Westman et al in view of Nigam and further in view of Carlson to effect intramolecular and/or intermolecular crosslinking of the sizing agents. Since the polymer would contain weakly acidic moieties, it would also have been obvious to add a well known weak base such as ammonium hydroxide to control the pH of the composition.

Claim 43 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kijlstra et al or Westman et al in view of Nigam and further in view of Carlson and Dumas (4522686).

Kijlstra et al, Westman et al, Nigam and Carlson do not disclose specific alkyl ketene dimers.

Dumas discloses aqueous sizing compositions comprising a ketene dimer as a hydrophobic cellulose reactive sizing agent (Abstract). Specific examples given of the dimer include octyl, decyl, dodecyl, tetradecyl, hexadecyl, octadecyl, eicosyl, docosyl, tetracosyl, phenyl, benzyl, beta-napthyl and cyclohexyl ketene dimers, ketene dimers prepared by known methods from montanic acid, naphthenic acid, $\Delta^{9,10}$ -decylenic acid, $\Delta^{9,10}$ -dodecylenic acid, palmitoleic acid, oleic acid, ricinoleic acid, linoleic acid, and eleostearic acid, as well as ketene dimers prepared from naturally occurring mixtures of fatty acids (col 4, lines 32-47).

The art of Kijlstra et al, Westman et al, Nigam, Carlson, Dumas and the instant invention are analogous as pertaining to compositions containing polymers comprising acrylic acid or acrylic acid derivatives and their use as sizing compositions. It would have been obvious to one of ordinary skill in the art at the time of the invention to use at least one of the claimed alkyl ketene dimers in the composition of Kijlstra et al or Westman et al in view of Nigam and further in view of Carlson and Dumas as well known and functionally equivalent options.

Claim 46 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kijlstra et al or Westman et al in view of Nigam and further in view of Carlson and Bailey et al (5885340).

Kijlstra et al, Westman et al, Nigam and Carlson do not disclose using a cationic alkyl ketene dimer.

Bailey et al discloses a paper sized with an alkyl ketene dimer wherein the alkyl group has 8-20 carbon atoms (col 3, lines 15-28). The paper coating can also comprise a starch adhesive (col 3, lines 35-41) and an acrylic acid in an amount up to 2% by weight (col 4, lines 19-27). Bailey et al teaches that cationic alkyl ketene dimer is a commercially available product, AQUAPEL® C519, from Hercules Corporation (col 6, lines 55-57).

The art of Kijlstra et al, Westman et al, Nigam, Carlson, Bailey et al and the instant invention are analogous as pertaining to sizing compositions. One of ordinary skill in the art would have been aware of available alkyl ketene dimers and it would thus have been obvious at the time of the invention to use a commercially available cationic alkyl ketene dimer in the composition of Kijlstra et al or Westman et al in view of Nigam and further in view of Carlson and Bailey et al as well known and functionally equivalent option.

Response to Arguments

Applicant's arguments filed 5/24/2006 have been fully considered but they are not persuasive. Applicant argues that the cited references fail to teach or suggest the acrylic acid containing composition in the amount recited in combination with ASA or AKD and a crosslinking agent. Note that the language of Claim 26 does not require an acrylic acid containing composition at all (less than 10 lb/ton includes zero lb/ton), and thus no crosslinking agent would be needed. Kijlstra et al and Westman et al do recite

an amount of acrylic containing composition in the claimed range in combination with ASA or AKD. Nigam teaches that it is known in the art to crosslink sizing compositions, thus one of ordinary skill in the art would have this knowledge and would find it obvious to crosslink the sizing composition with a reasonable expectation of success. Carlson discloses that polyvalent metallic oxides are known crosslinking agents for acrylic containing polymers. Again, this knowledge would have been available to one of ordinary skil in the art and it would have been obvious to use a known crosslinking agent with a reasonable expectation of success.

The disclosures in a reference must be evaluated for what they would fairly teach one of ordinary skill in the art. In re Snow, 471 F.2d 1400, 176 USPQ 328 (CCPA 1973); In re Boe, 355 F.2d 961, 148 USPQ 507 (CCPA 1966). Specifically, in considering the teachings of a reference, it is proper to take into account not only the specific teachings of the reference, but also the inferences that one skilled in the art would reasonably have been expected to draw from the reference. In re Preda, 401 F.2d 825, 159 USPQ 342 (CCPA 1968); In re Shepard, 319 F.2d 194, 138 USPQ 148 (CCPA 1963). In addition, it is proper to take into consideration not only the teachings of the prior art, but also the level of ordinary skill in the art. In re Luck, 476 F.2d 650, 177 USPQ 523 (CCPA 1973). Specifically, those of ordinary skill in the art are presumed to have some knowledge of the art apart from what is expressly disclosed in the references. In re Jacoby, 309 F.2d 513, 135 USPQ 317 (CCPA 1962). The use of crosslinking with sizing compositions as well as which crosslinking agents were effective would have been known to one of ordinary skill in the art.

The Declaration by Propst admits that it is known to add acrylic acid compositions to provide moisture resistance properties. Acrylic acid compositions are also known to be added as drainage and retention aids, as taught by Westman et al. AKD and/or ASA have been known as sizing agents for decades. Propst states that the inventors surprisingly discovered that the addition of AKD or ASA allows for less inclusion of acrylic acid containing composition. However, Kijlstra et al discloses paper sized with AKD or ASA and further sized with an acrylic containing composition, which is added in an amount within the claimed range, thus the composition is not novel. Crosslinking the sizing composition is known as taught by Nigam and a significant portion of the claimed crosslinking agents were disclosed by Carlson a half century ago, thus are well known in the art. It would have been within the skill of one of ordinary skill in the art to discover the optimum amount of acrylic acid composition to use in the sizing composition by routine experimentation.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dennis Cordray whose telephone number is 571-272-8244. The examiner can normally be reached on M - F, 7:30 -4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven Griffin can be reached on 571-272-1189. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

DRC

ERIC HUG
PRIMARY EXAMINER